



1200 G Street, NW
Suite 500
Washington, DC 20005

Phone: 202-628-6380
Fax: 202-393-5453
Web: www.atis.org

Chairman
William L. Smith
BellSouth Corporation

First Vice Chairman
Asok Chatterjee
Ericsson, Inc.

Second Vice Chairman
Christopher T. Rice
SBC Communications, Inc.

Treasurer
Mike Quigley
Alcatel

President & Chief
Executive Officer
Susan Miller
ATIS

Vice President of
Finance & Operations
William J. Klein
ATIS

May 17, 2005

VIA ELECTRONIC FILING

Marlene H. Dortch
Secretary
Office of the Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Status Report* in WT Docket No. 01-309
Section 68.4(a) of the Commission's Rules Governing
Hearing Aid Compatible Telephones

Dear Ms. Dortch:

The Alliance for Telecommunications Industry Solutions ("ATIS"), on behalf of its Incubator Solutions Program #4 ("AISP.4-HAC"), hereby files this third Status Report detailing the efforts that wireless handset device manufacturers and service providers are undertaking to comply with the Federal Communications Commission's ("FCC's" or "Commission's") hearing aid compatibility requirements. These requirements are specified in the Commission's *Report and Order* in the above-reference docket.

AISP.4-HAC is actively working on numerous technical issues related to hearing aid compatibility and may provide additional information in the near future regarding AISP.4-HAC's efforts to resolve outstanding challenges.

If there are any questions regarding this matter, please do not hesitate to contact the undersigned.

Sincerely,

Thomas Goode
Attorney
The Alliance for Telecommunications Industry Solutions
1200 G Street NW, Suite 500
Washington, DC 20005

Attachment

*"Developing Standards
that Drives the Business
of Communications and
Information Technology"*

**Before the
Federal Communications Commission
Washington, DC**

| | | |
|---|---|----------------------|
| In the Matter of |) | |
| |) | |
| Section 68.4(a) of the Commission's Rules |) | WT Docket No. 01-309 |
| Governing Hearing Aid Compatible Telephones |) | |
| |) | |
| |) | |

**Hearing Aid Compatibility Status Report #3
Submitted by**

**the Alliance for Telecommunications Industry Solutions (ATIS) on behalf of
the ATIS Incubator Solutions Program #4**

Table of Contents

| | |
|---|-----------|
| I. INTRODUCTION..... | 3 |
| II. GENERAL OVERVIEW OF AISP.4 | 3 |
| A. MEMBERSHIP | 4 |
| B. STATUS REPORT CONTENTS | 6 |
| III. BACKGROUND ON HAC | 6 |
| IV. TECHNOLOGY CHALLENGES FOR HAC..... | 7 |
| A. GSM TECHNOLOGY CHALLENGES FOR HAC..... | 8 |
| B. CDMA TECHNOLOGY CHALLENGES FOR HAC..... | 9 |
| C. iDEN™ TECHNOLOGY CHALLENGES FOR HAC | 9 |
| D. NORTH AMERICAN DIGITAL CELLULAR TDMA TECHNOLOGY CHALLENGES FOR HAC | 11 |
| V. STATUS, UPDATES, AND RECOMMENDATIONS..... | 11 |
| A. STATUS OF FAST-TRACK PROCESS..... | 11 |
| B. HAC STRATEGY FOR GSM AT 850 MHZ | 13 |
| C. CURRENT DATA AND FUTURE REPORTS..... | 13 |
| VI. AISP.4-HAC WORKING GROUPS..... | 14 |
| A. TEST PLAN WORKING GROUP (WG4)..... | 14 |
| B. LABELING AND CONSUMER OUTREACH WORKING GROUP (WG6)..... | 15 |
| C. ARTICULATION WEIGHTING FACTOR (WG8)..... | 16 |
| D. 850 MHZ AND HIGHER POWER CHALLENGES (WG9)..... | 18 |
| VII. CONCLUSION..... | 19 |
| ATTACHMENT A -- STATUS REPORT FORM TEMPLATE..... | 23 |
| ATTACHMENT A1 -- SUPPLEMENTAL STATUS REPORTS..... | 24 |
| ATTACHMENT B -- PLANAR DIPOLE RESULTS..... | 36 |
| ATTACHMENT C -- CHALLENGES SURROUNDING THE C63.19 STANDARD..... | 37 |
| ATTACHMENT D -- POWER LEVEL TABLES | 39 |
| ATTACHMENT E -- PIN-C FORM..... | 40 |
| ATTACHMENT F -- COMMON SYMBOLS FOR HEARING AID AND CELLULAR COMPATIBILITY..... | 42 |
| ATTACHMENT G -- SUGGESTED LANGUAGE FOR MANUAL OR INSERTS..... | 43 |
| ATTACHMENT H -- INFORMATION FOR HEARING HEALTH PROFESSIONALS | 44 |
| ATTACHMENT I -- INFORMATION FOR HA AND WIRELESS INDUSTRY | 45 |

I. INTRODUCTION

The Alliance for Telecommunications Industry Solutions (“ATIS”), on behalf of its Incubator Solutions Program #4 (“AISP.4-HAC” or “Incubator”), hereby files this third Status Report detailing the efforts that wireless handset device manufacturers and service providers are undertaking to comply with the Federal Communications Commission’s (“FCC’s” or “Commission’s”) hearing aid compatibility (“HAC”) requirements. These requirements are specified in the Commission’s *Report and Order* in WT Docket No. 01-39 (“*FCC Order* or “*R&O*”).¹

The AISP-HAC Status Report represents collective inputs from Incubator members and, pursuant to the Commission’s March 8, 2004 *Public Notice*,² is being submitted in lieu of individual status reports from those members.³ The Status Report also documents the Incubator’s accomplishments, objectives, HAC testing methodology and results for Wireless Devices (WDs) using the American National Standards Institute (ANSI) C63.19 Standard,⁴ product labeling and consumer outreach efforts, Articulation Weighting Factor (AWF) methodology, and technical challenges regarding specific air interface technologies.⁵

AISP.4-HAC notes that a number of recent, substantive developments have made it difficult for handset vendors to evaluate their products for hearing aid compatibility pursuant to the C63.19 Standard. These developments include, in particular, the revisions made to the recent release of version 3.6 of the draft 2005 C63.19 Standard.

II. GENERAL OVERVIEW OF AISP.4

AISP.4-HAC is composed of technical experts from the wireless industry representing wireless manufacturers and service providers, as well as technical experts representing the hearing aid industry. Representatives for consumer advocacy and disability groups such as Self Help for Hard of Hearing People (SHHH), Gallaudet University, and the

¹ In the Matter of Section 68.4(a) of the Commission’s Rules Governing Hearing Aid Compatible Telephones, *Report and Order*, WT Docket No. 01-309, released Aug. 14, 2003.

² *Public Notice*, WT Docket No. 01-309, DA 04-630, released Mar. 8, 2004.

³ The members of the AISP.4-HAC are listed in Section II of this document. Some members may be filing a supplemental report to provide additional information related to their company status.

⁴ *American National Standards for Methods of Measurement between Wireless Communications Devices and Hearing Aids* ANSI C63.19-2001 (“C63.19 Standard”).

⁵ The Commission’s *R&O* cites C63.19-2001, published October 8, 2001, as the standard to employ to determine the compatibility of hearing aids and wireless devices. The Commission recently-issued a *Public Notice*, DA 05-113-1, released April 25, 2005, clarifying that applicants for HAC compatibility certification may use either the 2001 or draft 2005 version of C63.19.

Georgia Tech Information Technology Technical Assistance and Training Center also participate in AISP.4-HAC meetings.

ATIS is a technical planning and standards development organization accredited by ANSI and committed to rapidly developing and promoting technical and operational standards for communications and related information technologies worldwide using a pragmatic, flexible and open approach. Industry professionals from more than 350 communications companies actively participate in ATIS' open industry committees, fora and "Incubators."⁶ The ATIS membership spans all segments of the industry, including local exchange carriers, inter-exchange carriers, wireless equipment manufacturers, competitive local exchange carriers, data local exchange carriers, wireless providers, providers of commercial mobile radio services, broadband providers, software developers and internet service providers.

The Incubator is focused on the technical issues addressing interoperability and compatibility of wireless devices with hearing aids, including the evaluation and test methodology of the measurement standard as referenced in the ANSI C63.19 Standard. The Incubator's mission is to investigate and identify interference issues affecting the performance of hearing aids and wireless devices, and to determine methods of enhancing interoperability and usability for consumers with hearing aids. The hearing aid and digital wireless industries face complexities and challenges in attempting to make their products compatible. Through an open and impartial consensus process, AISP.4-HAC is investigating and developing recommendations to the C63.19 Standard for measuring hearing aid immunity, magnetic coupling and interference caused by wireless devices.

A. Membership

The AISP.4-HAC has the following membership as of May 17, 2005:

VOTING MEMBERS

ALLTEL

Alpine PCS

American Cellular Corporation

Brookings Municipal Utilities d/b/a Swiftel Communications

Carolina West Wireless

Cingular Wireless, LLC⁷

Corr Wireless Communications, LLC

Cricket Communications

Dobson Cellular Systems, Inc.

⁶ATIS Incubators are industry-driven work groups that provide the industry with a "fast-track" process for resolving technical and operational issues. For more information, see the ATIS Incubator web site at: <http://www.atis.org/Incubator.shtml>.

⁷ On October 26, 2004, Cingular acquired AT&T Wireless. Cingular's Status Report Form contains information previously listed on AT&T Wireless' Status Report Form.

Epic Touch
Hearing Industries Association
Key Communications
Keystone Wireless
Kyocera Wireless
Leap Wireless
LG
Louisiana Unwired
Motorola, Inc.
NEC America, Inc.
Nextel Communications
Nextel Partners Inc.
Nokia
Panasonic
Pine Belt Cellular, Inc.
Qwest Wireless
RFB Cellular
Research In Motion Limited
Samsung Telecommunications America, LP
Siemens Communications Inc.
Sprint PCS
Sony Ericsson Mobile Communications (USA) Inc.
Suncom
T-Mobile USA
UTSTARCOM
Verizon Wireless
Western Wireless Corporation

WORKING PARTICIPANTS

American Academy of Audiology
American Academy of Dispensing Audiology
Alexander Graham Bell Association for the Deaf and Hard of Hearing
APREL Labs
American Speech-Language-Hearing Association
American National Standards Institute
ANSI ASC C63
Cellular Telecommunications & Internet Association
ETS-Lingren
Federal Communications Commission
Food and Drug Administration
Gallaudet University – Rehabilitation Engineering Research Center
Information Technology Technical Assistance and Training Center
PC Test Engineering Laboratory, Inc.
Self Help for Hard of Hearing People (SHHH)
Siemens Hearing Instruments

B. Status Report Contents

The Incubator Status Report includes information on the development of HAC WDs, including the technical challenges facing different air interface technologies.⁸ It also includes supplemental Status Report Forms completed by those Incubator member companies that elected individually to report on their company's HAC compliance progress data.⁹ A summary of these Status Report Forms is included in Section V of this Report. The Status Report also contains information on the efforts of AISP.4-HAC's working groups, including Working Group 4 -- Test Plan (WG4), Working Group 6 -- Labeling and Consumer Outreach (WG6), Working Group 8 - Articulation Weighting Factor (AWF) (WG8) and Working Group 9 --850 MHz and Higher Power Challenges (WG9). Among the technical and procedural issues that are addressed.

In addition, this third Status Report includes the following:

- (1) a discussion of changes identified by AISP.4-HAC that were not incorporated in the latest version of the ANSI C63.19 Standard as well as an explanation of revisions that have been made to this standard that create confusion in the measurement process;
- (2) a discussion of the technical challenges related to HAC for each interface technology in use in the US;
- (3) an examination of round robin test data repeatability for planar dipoles;
- (4) a discussion about the need for C63.19 to be re-opened for updates to the Audio Band Magnetic (ABM) and Articulation Weighting Factor (AWF);
- (5) an examination of round robin test data reproducibility from laboratory to laboratory;
- (6) a discussion of revisions made to the latest version of C63.19 Standard ASC C63 WG3 SC8 that create confusion in the measurement process; and
- (7) a discussion about the need for C63.19 to remain open for all updates and recommendations submitted.

III. BACKGROUND ON HAC

The Commission's *R&O* established new rules relating to hearing aid compatibility and wireless phones. The *R&O* also adopted the ANSI C63.19 Technical Measurement Standard for measuring and rating the wireless devices' compatibility with hearing aids,¹⁰ required manufacturers and service providers to make available a minimum number of HAC-compatible wireless devices, and established labeling requirements for HAC-

⁸ As used in this report, WD is a term that encompasses all wireless devices such as cellular telephones, handsets, and personal digital assistants.

⁹ See Attachment A.

¹⁰ *American National Standards for Methods of Measurement between Wireless Communications Devices and Hearing Aids* ANSI C63.19-2001 ("C63.19 Standard").

compliant devices. Importantly, the Commission recognized that the C63.19-2001 Standard remained a work in progress subject to further revisions, and acknowledged that its rules would need to accommodate such revisions.¹¹ The *R&O* also required wireless service providers and digital wireless handset manufacturers to report on their efforts toward compliance. For the first three (3) years after the effective date of the *R&O*, status reports must be filed semiannually. After the first three years and through the fifth year of implementation, the reports must be filed annually.¹²

On March 8, 2004, the Commission issued a *Public Notice*, DA 04-630, announcing May 17, 2005, as the deadline for the filing of the third report.¹³ In the *Public Notice*, the Commission noted that ATIS was collecting reports from manufacturers and Service providers for the purpose of submitting a collective report.¹⁴

IV. TECHNOLOGY CHALLENGES FOR HAC

Each of the wireless air interface technologies (CDMA, GSM, iDEN, TDMA) has challenges to overcome in order to achieve hearing aid compatibility in accordance with the C63.19 Technical Measurement Standard. These challenges stem from the environment in which WDs operate. For instance, because each air interface technology operates over multiple frequency bands, WDs may operate in single, dual, tri, or quad band modes depending on the specific WD design. In addition, there are multiple power classes within each of these air interface technologies which, in turn, generate a variety of RF fields. The ability to combine air interfaces as well as multiple frequency bands within a single wireless device creates tougher challenges and increases the level of complexity for achieving HAC WDs.

The digital wireless manufacturers have been working on their designs and measuring existing WDs to identify specific RF fields and surface “hot spots” on the faces of WDs that can be analyzed and evaluated to determine the technical feasibility of meeting the C63.19 Standard in accordance with the rating defined for M3.¹⁵ In these early evaluations and analyses, the WDs that were being tested were not designed for hearing aid compatibility. These WDs were “off the shelf” existing designs used to assist in identifying the level of the repeatability and the measurement variations that were associated with the existing industrial designs of the WDs.

¹¹ *R&O* at ¶ 63.

¹² *R&O* at ¶89.

¹³ This *Public Notice* also announced future filing dates of: November 17, 2005, May 17, 2006, November 17, 2006, November 19, 2007, and November 17, 2008.

¹⁴ This *Public Notice* provides that “manufacturers and service providers may submit joint reports.”

¹⁵ The 2005 draft version of the C63.19 incorporates the AISP.4-HAC’s recommendation regarding the labeling of WDs to HAC. This version uses an “M” rating for RF Immunity and a “T” rating for Acoustic Coupling. The 2005 version’s labeling is consistent with the switches on hearing aids, which specify “M” for Microphone and “T” for T-Coil ratings.

Through the Incubator's testing and analyses manufacturers have highlighted several complexities and challenges in efforts to make their products compatible with the measurement requirements of the C63.19 Standard. Test data have shown that WDs operating within the Part 22 and Part 90 800/900 MHz frequency bands (collectively referred to here as the "850 band"), have an even greater challenge with regard to HAC compatibility and meeting the compliance rating of the ANSI C63.19-2001 Version 3.6 Standard for measurement acceptance.

While the Incubator believes that wireless manufacturers will continue to strive to meet the regulatory requirements defined by the FCC's *R&O* for HAC for two products per air interface (GSM, CDMA, iDEN, TDMA), the wireless industry has also recently documented several challenges to achieving HAC compatibility measurements of M3 or M4 for GSM handset devices operating in the 850 MHz frequency band. This challenge appears to be industry-wide.

Producing products that meet and support disabled consumers' needs and carriers' requirements are of utmost importance to wireless manufacturers. At this time, GSM wireless manufacturers are investigating all possible compliance options, both internally and through meetings with carriers and industry groups. These companies are considering various options and are working to identify acceptable product changes to address and resolve the challenges of creating HAC 850 MHz GSM devices.

Air interface technologies and operating bands are detailed below in order to provide additional information about the specific challenges facing manufacturers and service providers in ensuring HAC.

A. GSM Technology Challenges for HAC

In the United States, GSM technology operates in the 850 and 1900 MHz bands. Although ratings of M3 or better have been achieved for the 1900 band, manufacturers have identified various critical challenges to achieving HAC for the GSM 850 MHz band.

When the C63.19 Standard was being developed in 1996, GSM deployment was generally limited to the 1900 MHz band. GSM 850 MHz was initially deployed in 2001 with limited equipment. Many of the assumptions made in the *R&O* have simply not proven to apply to GSM at 850 MHz.¹⁶ For instance, GSM 850 MHz wireless devices transmit at twice the power of wireless devices in the 1900 MHz band, causing more interference with specific hearing aids.¹⁷ The same issue exists for GSM 850 MHz

¹⁶ The FCC noted in the *R&O* that it anticipated that most phones will not require changes to their core design in order to meet the two year compliance deadline" (*R&O* at ¶ 71.) This is not the case for 850 MHz GSM phones which may require an unanticipated change in their core design.

¹⁷ Within the Power Class 4 of the ETSI Standard, GSM WDs operate in the 850 MHz band at up to two watts (2W) transmitter output power. 3GPP TS 51.010-1 V6.1.0 (2005-02).

customers who roam outside North America onto a GSM 900 MHz network, which also operates at two watts. Therefore, the wireless industry notes that significant, fundamental technical challenges remain to achieving M3 ratings, in the absence of alternative solutions, for GSM 850 MHz band WDs by September 2005.

The advent of WCDMA overlay in GSM 850 and GSM 1900 areas may resolve some interference issues. The newly-formed Working Group 9 of AISP.4-HAC will examine the extent to which Universal Mobile Telecommunications System (UMTS) and other future protocols and technologies can address accessibility for deaf and hard of hearing consumers.¹⁸

The next step identified by AISP.4-HAC is to identify potential design options to achieve HAC for WDs operating in the 850 MHz band and to determine which of these options is preferred based on user preference, cost, and achievability. The AISP.4-HAC WG-9 will develop time frames to present such information to interest groups, industry and the FCC for consideration.

B. CDMA Technology Challenges for HAC

One challenge faced by CDMA WDs relates to the definition of “peak power.” The definition of peak power used for ratings measurements and calculations is crucial to whether a CDMA device meets the HAC RF requirements. For instance, if a device is determined to have an M3 rating using the “peak envelope” method, it would be determined to have only an M2 rating using the “peak signal” method.

In addition, a substantive change occurred in C63.19-2005 in which the measurement of the RF signal modulation factor intended to indicate the impact on audio articulation was changed to use peak RF power rather than average RF power. The impact of this change will have to be assessed to determine the ratings impact on CDMA products that will be available by the initial compliance date.

C. iDEN™ Technology Challenges for HAC

A similar challenge relating to the definition of “peak power” is also faced by iDEN WDs. As with CDMA WDs, the definition of “peak power” and the definition of “peak envelope” are impacted by the change in the measurement of RF signal modulation in C63.19-2005. The definition of peak power used for ratings measurements and calculations is crucial to whether iDEN WDs meet HAC RF requirements. If a device is determined to have an M3 rating using the “peak envelope” method, it would only have an M2 or high M1 rating using the “peak signal” method.

iDEN handsets are utilized by about 18 million users via service offerings from Nextel and Southern Linc. These handsets transmit in the 806-825 MHz and 896-902 MHz

¹⁸ Universal Mobile Telecommunications System (UMTS) was added to the draft C63.19-2005 version of the standard. Information presented to the C63 SC8 committee proved UMTS was justified in having an AWF of 0 dB.

ESMR bands which straddle the 825-849 MHz cellular reverse link band in which other TDMA forms are deployed (NADC TDMA and GSM). Handsets transmit in either one or two 15 ms. time slots in a 90 ms. frame resulting in RF carrier pulsations at an 11 Hz or 22 Hz rate. Time Division Multiplexed (TDM) pulses are transmitted at a nominal burst average power of 27.8 dB which is very close to GSM power level 8 (see Attachment D, *Table 3*), but with lower tolerance. Further, *iDEN* employs an advanced OFDM type multichannel 16-QAM digital modulation which transmits symbols at a 4 kHz rate with non-constant envelope power, as summarily described in Annex G of C63.19-2005.

Though deployed since 1995, the *iDEN* modulation protocol was excluded from C63.19-2001 and no Articulation Weighting Factor (AWF) was assigned, even though it was evaluated with the other interface technologies in an FDA study reported in the IEEE Transactions on Rehabilitation Engineering.¹⁹ The FDA study shows the peak hearing aid induced acoustic modulation signal components (11 Hz fundamental, and harmonics) due to ON/OFF keying of the RF carrier are 10 dB or more below those from the other TDMA forms in the spectrum (compare figure 8 with figures 5 and 7 in the FDA Study) of the hearing aid passband, and there are fewer harmonic components. The AWF adopted in C63.19-2005 is therefore justified.

This non-constant RF power envelope modulation has a peak-to-average ratio of about 5.9 dB when measured over the entire 15 ms. burst. This serves to increase the peak envelope power to about 33.7 dBm (2.34 Watts), which is about 0.7 dB greater than that of GSM power level 3 noted in Attachment D *Table 3*. Very few of these components are evident in the spectrogram in the FDA study, and those that are present are 30 dB less than those related to the 11 Hz ON/OFF keying rate due to TDM RF bursts. This acoustic modulation characteristic comparison shows the advanced RF modulation symbols do not appear to contribute significant energy to the induced acoustic signal.

Plots in Figure 3 of the FDA Study show that at near-field distances of 2 cm or less from the hearing aid (like the 1 cm distance used for near-field measurements as specified in the C63.19 Standard) GSM, NADC TDMA, CDMA (variable rate vocoder) and *iDEN* protocols produced an amount of interference that was in a relatively narrow range of 4.5 dB. In contrast, CDMA operating with the full rate vocoder produced a signal significantly lower by about 26 dB. The difference in CDMA performance is attributed to the fact that within a 20 ms. frame (i.e. – 50 Hz), 1.25 ms duration RF carrier power bursts are randomly ON/OFF keyed just like periodic TDMA RF pulses, with the keying rate dependent upon the amount of voice activity.²⁰ With that consideration of the CDMA signals it becomes apparent from the plots that the amount of near-field interference produced increased with the repetition rate of ON/OFF keying of the RF signal associated with the transmission protocol.

¹⁹ Hearing Aid Electromagnetic Interference from Wireless Devices, Marlene Skopec, IEEE Transactions on Rehabilitation Engineering, Vol. 6, No. 2, June 1998 (“The FDA Study”).

²⁰ Rapport, Theodore S.; Wireless Communications, Principles and Practice; Prentice Hall 1996.

At this time, significant variations exist between labs in the ATIS Incubator due to this change in measurement method of the modulation factor for the iDEN signal. As a consequence, contrary to expectations in the *R&O*, the number and percentage of current Motorola iDEN core design handsets herein deemed M-rating compliant is not sufficient to ensure Motorola meets its 47 CFR 20.19 statutory obligation, and is insufficient to ensure that dependent service providers can meet their obligations. This change also has reduced the rating of prototypes of 3 new models from M3 to M2 (not counted in the Motorola Status Report Form attached hereto in Attachment A1) planned for release next period and significant engineering effort is being directed to predict and identify HAC beneficial design changes of the core designs to enable compliance.

D. North American Digital Cellular TDMA Technology Challenges for HAC

The wireless industry is recommending that the FCC consider removing the requirements for TDMA since this technology is being phased out. *Petitions for Reconsideration* are pending on this matter.

V. STATUS, UPDATES, AND RECOMMENDATIONS

A. Status of Fast-Track Process

AISP.4-HAC uses a “fast track” process to identify, agree to, and manage changes to the C63.19 Standard in order to facilitate compliance with the deadlines set forth in the *R&O*. This fast track process was defined in the initial report.

As part of this “fast track” process, the Incubator formed the test plan working group (WG4) to evaluate the C63.19 Standard and to ensure the test methods defined in the C63.19 Standard are repeatable and reproducible. AISP.4-HAC WG-4 was focused on improvements to C63.19-2001 Section 4 (entitled Wireless Device RF Emissions Test) and its associated Annexes to enable consistent and accurate measurement and data reporting of compliance measurements by the September 2005 deadline. Hundreds of substantive technical and editorial changes were contributed through the initial letter ballot and 3 subsequent recirculation ballots. These changes were the results from the Incubator inter-laboratory testing and the round robin near-field measurements previously reported.

In their final ballot review of the C63.19 Standard version 3.3, the Incubator’s WG4 submitted 39 changes that were identified as non-controversial (or “editorial”), for the ASC C63 ballot group to review. WG-4 was advised that all changes termed “editorial” would likely be approved without discussion by the committee. Revision draft 3.4 of the Standard was published with no balloting group review. Unfortunately, there were expected changes that did not occur and substantive technical changes that affected this report. The Incubator is concerned that ASC C63’s expedited process has circumvented conventional standards development processes and failed to satisfy participants’ due process expectations per ASC C63 operating procedures. In particular, the change from

average to peak power and the removal of all definitions and tables defining peak power from revision draft 3.4 is problematic for the wireless industry.

The expedited ASC C63 process *did not produce optimal end results*. In order to facilitate the passage of the non-controversial changes and keep the tight schedule necessary to complete the standard in time to test devices, Incubator members made use of the ASC C63 process of providing affirmative votes with comments (as opposed to casting negative votes). However, because it appears that a technical change was also made at that time, the Incubator's members believe that they did not have adequate opportunity to provide comment on this technical change. The Incubator was stuck in a quandary. Had the Incubator provided negative comments, the process would have been too slow; providing affirmative comments resulted in inadequate notice of a technical change. The process resulted in allowing for approval of aspects of the standard that the members did not have an opportunity to see until the revision ballot was circulated and upon which they were unable to comment.

Additional procedural concerns exist. The C63.19-200x balloting process resulted in a public review cycle being opened within the ANSI organization. This review cycle was posted in the ANSI weekly register on April 22, 2005. Since this notice publication date, the Incubator was notified that there was a revised version 3.6 of C63.19. According to the ANSI notice, the comments for this review cycle of the C63.19-200x are due June 20, 2005. The ANSI notice gives specific instructions to contact IEEE to receive the C63.19-200x publication. Upon contact with IEEE, the IEEE gave instructions to purchase the revised publication from the IEEE store.

Until May 12, 2005 the Revision 3.6 was unavailable from IEEE. On that date the IEEE store enabled the document to be purchased using the customer service line but not through the on-line store. This review cycle and process may not give the public enough time to evaluate the proper version of C63.19-200x due to the delay of having the C63.19 version 3.6 available to purchase and review by June 20, 2005. One possible partial remedy to this situation is to contribute comments via the ANSI public notice process described in their April 22, 2005, public notice.

In addition, it was expected that a subsequent revision of the standard would be possible for 2006 to accommodate changes associated with the third recirculation ballot after a committee meeting to review the resolution and AISP.4-HAC WG-4 Phase 2 findings. It was also expected that a new ANSI Project Initiation Notification System (PINS) form would be completed and processed in ASC C63 SC 8 and the Consensus Body at its April 2005 meeting. The PIN would be forwarded to ANSI and a SC 8 Working Group meeting would be subsequently held to collect inputs and develop a draft revision that would follow the same ANSI balloting process as C63.19-2005. Instead, a more informal PINS-C notification was adopted (this notification is attached hereto as Attachment E).

The incubator requests ANSI ASC C63 clarify definition and measurement of "peak power," and determine whether it is "absolute, instantaneous peak," or power "during the transmit period."

B. HAC Strategy for GSM at 850 MHz

Compliance with FCC requirements is critical for equipment and service providers in the 850 MHz GSM band. The ATIS Incubator has organized a separate Working Group consisting of GSM 850 MHz WD manufacturers and carriers committed to addressing this issue. Manufacturers will focus energy on this challenge to evaluate potential solutions in a cooperative, goal-focused setting. Individual companies are internally reviewing all possible options and working in conjunction with consumers and industry groups. These options are being discussed by manufacturers with their carrier customers and managed within the carrier/supplier relationship to identify product changes that would need to occur to address and ultimately to resolve the challenges of GSM 850MHz.

C. Current Data and Future Reports

This Status Report includes Status Report Forms²¹ completed by Incubator member companies that have elected to report individual company's HAC compliance data. However, because the FCC's TCB training did not take place until recently, capacity constraints on the availability and supply of reliable HAC lab facilities may prevent some manufacturers from testing all of their products to the new standard at this time. Therefore, the following summary table does not represent all manufacturers and service providers. Future reports will be more comprehensive.

Table 1- Consolidated Status Report on Hearing Aid Compatibility^{N1}

| Consolidated Status Report on Hearing Aid Compatibility | Quantity |
|---|-----------------|
| Wireless Industry Companies Participating in AISP.4-HAC: | 36 |
| Wireless Service Providers Participating in AISP.4-HAC | 26 |
| Wireless Device (WD) Manufacturers: | 10 |
| CDMA | 7 |
| GSM | 3 |
| iDEN | 2 |
| TDMA ^{N2} | -- |
| Total Compliant WD Models : | 12 |
| Total WDs Offered | NR |

N1: Not all manufacturers and service providers were able to characterize their products based on the 2005 version of C63.19.

N2: TDMA is being phased out and replaced by GSM.

²² See Appendix A -- Status Report on Hearing Aid Compatibility.

VI. AISP.4-HAC WORKING GROUPS

Working Groups have been formed within the Incubator to: (1) direct the focus of experts on specific issues; (2) promote effective member collaboration on ideas; and (3) document recommendations for review and discussion by the full Incubator. Each request for a Working Group must have a defined scope and specific deliverable. The full AISP.4-HAC then decides if the Working Group should be created. Once the deliverable is accomplished, the Working Group is dissolved. The Working Group deliverable is then brought to full AISP.4-HAC for adoption as an Agreement Reached. Currently, there are four (4) active AISP.4-HAC Working Groups: WG4--Test Plan; WG6--Labeling and Consumer Outreach; and WG8--Articulation Weighting Factor (AWF), and WG9--850 MHz and Higher Power Challenges.

A. Test Plan Working Group (WG4)

WG4 was created to conduct a thorough review of the C63.19 Standard and to determine how to enable reliability and accuracy in a wireless device lab's test results when using this standard.²² The Working Group implemented a round robin testing effort to evaluate the wireless device lab results, which consisted of seven (7) manufacturers and three (3) independent labs. The round-robin participants each tested 13 different WD models using 22 different frequency band /air interface combinations. The WD models were tested for RF emissions per the described measurement guidelines defined in the AISP.4-HAC Hearing Aid Compatibility Test Specification ("HACTS") document.

Round-Robin Testing Update

In the initial round robin tests, WG-4 was unable to obtain reproducible test results from the participating labs. Several possible causes for variability of the test results were uncovered and resolved in the latest version of C63.19 2005. Details of the WG-4's efforts are defined in Attachment B of this Status Report.

The WG has successfully changed procedures in order to resolve the inconsistent test results reported in the August 2004 report. The WG took the following steps:

- Created a planar dipole test plan in an attempt to identify the sources of the test inconsistencies.
- Routed a set of planar dipoles to all labs for testing.
- The first two labs worked out their inconsistencies and updated the planar dipole test plan accordingly.
- The next labs then tested using the updated test plan and worked out any inconsistencies.

²² The C63.19 Standard has two distinct test areas – hearing aids and wireless devices. The Incubator HACTS pertains to wireless devices only.

All labs have completed the testing and the test results are contained in Attachment (B). The results have been promising. The standard deviation (SD) percentage was (-8.22%) from predicted for the E-field testing and (-3.83%) was from predicted for the H-field testing. The planar dipole test procedure used was that procedure included in the C63.19 2001 Standard Version 3.5.

Using the lessons learned from the planar dipole testing, WG4 is now conducting another round of tests based on the standard using the same wireless devices. The test results from this round will be included in the next report.

B. Labeling and Consumer Outreach Working Group (WG6)

WG6 draws on the extensive expertise of consumers, audiologists and representatives from Gallaudet University and Georgia Tech Information Technology Technical Assistance and Training Center, wireless manufacturers, wireless service providers, as well as various advocates in the hearing loss field. The deliverable for this Working Group is to develop a labeling and outreach plan that is consistent, concise and clear. This plan seeks to broaden education around the wireless device compatibility, its language, and identifiable markings. In preparation for targeted outreach prior to the effective date of the order, an outreach database has been created and is continually being updated.

Three “labels” have been designed by WG6 members (these labels are attached hereto as Attachment F). Two of these labels are considered acceptable by consumers; the third will be included as it meets the requirements of the *R&O* and may be used by some companies – especially when faced with space limitations.

In addition, several key consumer, audiology and industry conferences have been identified for outreach opportunities and material has been developed for the wireless industry, hearing health professionals and for consumers. One of the materials developed is suggested language for cellular product manuals or packaging inserts that clearly explains compatibility ratings to the consumer. Another is a brochure for the wireless industry that summarizes the responsibilities for the industry under the *R&O*. A third introduces and explains the wireless compatibility ratings to hearing health professionals and provides resources where they may look for more information for themselves and their clients.

As another outreach effort, the Incubator is hosting the Wireless Center of Excellence at the Self Help for Hard of Hearing People (SHHH) convention in June.²³ The Center will allow consumers to try several wireless devices from several manufacturers in one place. In addition, members of WG6 will be presenting at the Telecommunications for the Deaf, Inc. (TDI) convention and conducting outreach to federal employees with disabilities.

²³ The SHHH Convention will take place June 30-July 3, 2005 in Washington, D.C.

Informational brochures have been created for the industry and hearing health professionals and a third is underway for consumers.

The Incubator has also undertaken efforts to reduce the possibility of confusion due to the FCC's recent decision to permit reliance on either the 2001 or draft 2005 version of the C63.19 Standard. On May 4, 2005, representatives of the AISP.4-HAC met with representatives of the FCC's Wireless Bureau and Office of Engineering Technology to discuss possible confusion stemming from the FCC's April 25 *Public Notice*. In this *Public Notice*, the FCC permitted applicants for hearing aid compatibility to rely on either the 2001 or draft 2005 version of the C63.19 Standard. ATIS HAC Incubator representatives noted that this may cause confusion because these two versions specify different letter designations for HAC compliance. The 2001 version of the C63.19 Standard uses a "U" rating for radio frequency (RF) Immunity and a "UT" rating for Acoustic Coupling. The 2005 draft of this standard, on the other hand, uses an "M" rating for RF Immunity and a "T" rating for Acoustic Coupling. (The 2005 version's labeling is consistent with the switches on hearing aids, which specify "M" for Microphone and "T" for T-Coil.) The ATIS HAC Incubator urged the FCC to provide written clarification to the industry that the labels specified in the 2005 draft version of the standard ("M" and "T" ratings) can and should be used to designate HAC compatibility.

C. Articulation Weighting Factor (WG8)

WG8 was established by the Incubator to develop a direct computational method to determine the Articulation Weighting Factor (AWF), a value used to predict the potential for audible interference due to modulation rate and duty cycle factors of a specific mux technology. Both the 2001 and 2005 versions of the C63.19 Standard use AWF, an unmeasured cell phone parameter, to characterize all air interfaces and adjust the limits that determine the rating of the handset (under the draft 2005 version of the C63.19 Standard, the ratings are "M" and "T;" under the under the 2001 version, the rating are "U" and "UT"). After an exhaustive research effort, the Incubator was unable to locate documentation and ASC C63 could not provide any documentation to determine how the AWF was initially created so it could be replicated to determine an AWF value for technologies that emerged after, or were excluded from, the C63.19-2001 Standard. New technologies are continually being implemented by service providers and deployment requires handsets using these new technologies to be evaluated for AWF.

The Incubator WG8 intends to create a simple, cost effective, reproducible method for determining the AWF for new technologies based on psychoacoustic correlation. Based on conversations with multiple hearing aid manufacturers at the 2005 American Academy of Audiologists Convention, the AISP.4-HAC learned that the analog technology used in the development of C63.19-2001 is now largely obsolete. Essentially all new hearing aid products are based on and include digital technology, and include advanced features such as automatic gain control, selective noise suppression, directionality characteristics, and T-coil switching. These technological innovations in digital hearing aids may impact how these hearing aids interact with wireless handsets.

This WG, made up of both wireless and hearing industry representatives, will develop recommendations to insure new feature interoperability.

It is intended that findings of this WG8 study will be submitted as a supplement to the C63.19 Standard to eliminate ambiguity in AWF determination. For integration of these findings into the C63.19 Standard a PINS form was prepared and placed on the agenda at the most recent meeting of the ASC C63 Subcommittee 8 under which C63.19 is prepared.

The scope of the ATIS Incubator WG8 is to determine suitable values of AWF for current and emerging wireless digital telephony modulations, or an alternative speech intelligibility impact assessment method applicable to wireless telephone device assessment, and to pursue standardization of the resultant so it may be routinely employed and coordinated with the C63.19 Standard as new digital wireless telephony modulations are deployed. Since there are numerous types of hearing aid electronic designs it appears necessary to include consideration of their characteristics (e.g. – non-linearity and automatic gain control) as well. Unfortunately, the C63.19 Standard provides no consideration of these different hearing aid characteristics.

The WG anticipates a four step process to complete its deliverable. First, a review will be conducted to understand and document the process by which AWF was determined for the legacy modulations included in C63.19-2001. During this step measurement means (e.g. – spectral analysis, CISPR-B detection, and A- or B-weighting will be investigated and data collected to characterize the audio signals induced by the different modulations using a setup modeled after that used in Figure 5-1 of the C63.19 Standard to assess hearing aid immunity. Digital recordings of these sounds and their spectrograms will be made in a format agreed upon with second stage participants, and various types of hearing aids will be included. Also quantified in this step will be the amount of hearing aid gain reduction of the desired signal, as it is another factor affecting the reception of wireless device telephone calls.

The second step will be a study to evaluate the impact on speech intelligibility using the digital recordings made during Step 1. The impact will be related to the characteristics of the audio signals to quantify their interactions. Both objective and subjective evaluations shall be performed using the same types of hearing aids involved in the first stage. Objective evaluations might include predictive speech quality measures such as PESQ.

In the third step, the impact assessment results of the second step will be related to measurable characteristics of wireless telephony devices. AWF currently does this by making the RF near-field criteria more stringent on a square law basis. The resultant handset assessment methodology will then be evaluated in a round-robin type measurement reproducibility experiment to provide a firm basis for revisions to the C63.19 Standard or other existing audio or hearing aid standards, or possibly a new standard.

Finally, the fourth step will be an outreach effort to incorporate the developed methodology in the C63.19 Standard and possibly into other forums.

D. 850 MHz and Higher Power Challenges (WG9)

The objective of the AISP.4-HAC WG9 -- 850 MHz and Higher Power Challenges -- is to provide an interdisciplinary industry collaborative process for the study and assessment of wireless devices and hearing aids, the development of solutions, and verification of compatibility with respect to the challenges associated with GSM and other 850 MHz wireless mobile devices.

The hearing aid and digital wireless industries have complexities and challenges in attempting to make their products compatible. Test data has shown that wireless devices operating within the frequency band of GSM 850MHz have even a greater challenge with regards to compatibility and meeting the two highest compliance ratings of the ANSI C63.19-2001 Version 3.4 Standard (ANSI C63.19-2005 if adopted by ANSI) for measurement acceptance as required by the FCC. WG9 will explore these challenges for GSM and other 850 MHz bands and document the findings so that all parties have a clearer understanding of the complexities involved. Through an open and impartial consensus process, WG9 group intends to:

- Identify the specific characteristics and properties of GSM and other 850 MHz handsets;
- Identify sources of interference at GSM and other 850MHz bands using the current measurement techniques;
- Identify variables that attribute to this interference;
- Identify and define implementable solutions for any interference to hearing aids by digital wireless cell phone operating at GSM and other 850 MHz bands; and
- Facilitate the assessment of the existing ANSI C63.19 measurement standard and explore necessary changes

WG9 will seek to identify and document reasons for emission levels outside the two highest defined levels identified in the C63.19 Test Measurement Standard required by the FCC, and to discuss and document technical solutions and options that must be considered to ensure HAC compliance of GSM and other 850 MHz bands digital wireless devices. Specifically addressing GSM 850 MHz, WG9 will:

- Identify the specific characteristics and properties of GSM 850 MHz handsets;
- Assess these characteristics with the technical parameters and test methods in C63.19;
- Identify a consensus range of RF levels and Magnetic Interference tolerances for GSM 850 MHz handsets;
- Gather anecdotal information on proposed solutions and evaluate their feasibility;
- Document the fundamental properties, methodologies, and characteristics of GSM 850 MHz handsets;

- Analyze aggregate test results as reported to the group by individual companies;
- Provide an assessment of the GSM 850 MHz handsets to the FCC, carriers, and consumers, based on the acceptance criteria defined in the C63.19 Standard; and
- Document the findings and discuss alternatives, solutions, and trade-offs to achieving compliance with the C63.19 Standard.

VII. CONCLUSION

The AISP.4-HAC has made significant progress towards the FCC's *R&O* for Hearing Aid Compatibility. The Incubator has continued to drive industry participation and consistent interpretation of test and measurement requirements as defined in the ANSI C63.19 Standard. The technical challenges for HAC outlined in this Status Report are noted to provide information on the wireless industry's efforts to address these challenges.

In the *R&O*, the Commission acknowledged that the requirements for HAC may be more difficult to implement for some air interfaces than for others.²⁴ The AISP.4-HAC Incubator agrees and believes that the data and related information regarding these specific air interfaces should be reviewed by the Commission to ensure that its rules are technological neutral. The AISP.4-HAC will continue to identify all possible options and acceptable trade-offs to address any unresolved challenges through the creation of new working groups, such as WG8, which is addressing the Articulation Weighting Factor, and WG9, which is focused on wireless devices operating at 850 MHz with higher output powers.

AISP.4-HAC continues its significant educational and outreach efforts. It has developed several nonproprietary brochures for the wireless industry and hearing health professionals. Additionally, outreach material targeting consumers is under development and should be ready for distribution prior to this summer's conferences. Three HAC "labels" have been developed and tested.

The Incubator commends the FCC's decision to allow TCBs to certify WDs for HAC compliance following the May 2005 TCB Council Workshop. Although the Incubator believes the TCB Workshop is necessary to support compliance filings for wireless devices meeting HAC, it is concerned that, because the workshop did not start until four months before the *R&O* due date, manufacturers may face problems meeting the September 2005 deadline. An expected rush of products to those TCBs that completed the Workshop may result in a bottleneck, creating a backlog of product compliance applications that may not be processed prior to the deadline.

In the Incubator's efforts to finalize the C63.19 Standard and enable manufacturers and TCB labs to follow a clear and concise measurement procedure, the Incubator

²⁴ *R&O* at ¶76.

recommends that the following suggestions be implemented to support the wireless industry efforts and the future development and use of C63.19 Standard:

- Amend the *R&O* and Commission rules to incorporate only the most current version of C63.19-2005;
- Amend the *R&O* to support future changes to be implemented in the C63.19 Standard;
- Encourage ASC C63 to remain active, taking into consideration emerging technologies, and contributions initiated by the Incubator;
- Specify that only label references “M” and “T” be used to indicate the wireless devices HAC rating, regardless of which version of the C63.19 Standard is used;
- Endorse Incubator efforts to develop interdisciplinary industry processes to create recommendations and options through industry consensus;
- Allow the Incubator to address the technical challenges relating to the 850 MHz and higher power issues;
- Support Incubator efforts to create a scientific method for determining the Articulation Weighting Factor (AFW) for future technologies; and
- Support Incubator efforts to define critical interfaces for both the wireless and hearing industries devices (i.e. T-Coil position, automatic sensing and switching to T-Coil mode).

WHEREFORE, THE PREMISES CONSIDERED, ATIS, on behalf of AISP.4-HAC, respectfully submits this Third Report on Hearing Aid Compatibility Compliance Efforts for inclusion on the record in this proceeding.

Respectfully submitted by:

ATIS on behalf of AISP.4-HAC,



Thomas Goode
Attorney
ATIS
1200 G Street, NW
Suite 500
Washington, DC 20005

May 17, 2005

AISP.4-HAC REPORTING COMPANY MEMBERS

ALLTEL
Alpine PCS
American Cellular Corporation
Brookings Municipal Utilities d/b/a Swiftel
Communications
Carolina West Wireless
Cingular Wireless LLC
Corr Wireless Communications, LLC
Cricket Communications
Dobson Cellular Systems, Inc.
Epic Touch
Key Communications
Keystone Wireless
Kyocera Wireless
Leap Wireless
LG
Louisiana Unwired, LLC
Motorola
NEC America, Inc.
Nextel Communications
Nextel Partners Inc.
Nokia
Panasonic
Pine Belt Cellular Inc.
Qwest Wireless
RFB Cellular
Research In Motion Limited
Samsung Telecommunications America, LP
Siemens Communications Inc.
Sprint PCS
Sony Ericsson Mobile Communications (USA) Inc.
Suncom
T-Mobile USA
UTSTARCOM
Verizon Wireless
Western Wireless Corporation

ATTACHMENT A -- Status Report Form Template

| Status Report on Hearing Aid Compatibility | | | |
|--|---------------------------|------------------|--|
| Company Name: | | | |
| Address: | | | |
| City: | State: | Zip Code: | |
| Phone: | Fax: | Email: | |
| Compliant Phone Models: | | | |
| Phone Model | ANSI C63.19 Rating | | |
| | | | |
| | | | |
| | | | |
| Product Labeling Information: | | | |
| | | | |
| Outreach Efforts: | | | |
| | | | |
| Retail Availability of Compliant Phones: | | | |
| | | | |
| Efforts to Incorporate Hearing Aid Compatibility into Newer Models: | | | |
| | | | |
| Activities Related to ANSI C63.19 or Other Standards Work : | | | |
| | | | |
| Total Number of Compliant Phones Offered: | | | |
| Total Number of Non-Compliant Phones Offered: | | | |
| Ongoing Efforts for Interoperability Testing with Hearing Aids: | | | |
| | | | |
| Information regarding differences in handset offerings among regions in service areas (For Service Providers only): | | | |
| | | | |

ATTACHMENT A1 -- Supplemental Status Reports

RIM Status Report

| Status Report on Hearing Aid Compatibility | | |
|---|---|--------------------------------|
| Company Name: Research In Motion Limited | | |
| Address: 305 Phillip Street | | |
| City: Waterloo | State: ON | Zip Code: N2L 3W8 |
| Phone: (519) 888-7465 ext 5380 | Fax: 519-880-8193 | Email: ddougall@rim.com |
| Compliant Phone Models: (Note: Testing conducted by RTS – RIM Testing Services) | | |
| Phone Model | ANSI C63.19 Rating – 2005 Release Used for Testing * | |
| BlackBerry 7520 (iDEN 800 MHz) | M3 | |
| BlackBerry 7750 (CDMA 800/1900 MHz) | M3 | |
| BlackBerry 7250 (CDMA 800/1900 MHz) | M3 | |
| BlackBerry 7230 (GSM 1900 MHz) | M3 | |
| <small>* The E-field and H-field measurement probes' responses to the RF power envelope employed by the Wireless Device (WD) were characterized to obtain a probe modulation conversion factor following the procedure provided in Section C.3.1 in the manner illustrated in figure C-1.</small> | | |
| Product Labeling Information: | | |
| RIM will comply with the FCC requirements for box labeling and in-box documentation for HAC compliant models. | | |
| Outreach Efforts: | | |
| RIM will be participating in the ATIS Wireless Center of Excellence at the upcoming SHHH Conference in Washington, and is a sponsor for the upcoming TDI Conference in New Orleans. RIM also has an ongoing dialogue with consumer advocacy groups including NAD and TDI. | | |
| Retail Availability of Compliant Phones: | | |
| N/A – Contingent on Carrier Retail Plans for these particular HAC models. | | |
| Efforts to Incorporate Hearing Aid Compatibility into Newer Models: | | |
| RIM is actively investigating approaches for providing hearing aid compatibility in future models. | | |
| Activities Related to ANSI C63.19 or Other Standards Work : | | |
| RIM is an active participant in the ATIS HAC Incubator, including AISP.4-WG4 Testing Group, AISP.4-WG6 on Product Labeling, AISP.4 – WG8 on AWF, and AISP.4-WG9 GSM 850. | | |
| Total Number of Compliant Phones Offered: | 4 | |
| Total Number of Non-Compliant Phones Offered: | | |
| Ongoing Efforts for Interoperability Testing with Hearing Aids: | | |
| RIM products are tested with the consuming public, including persons with disabilities. RIM is also working with a hearing aid manufacturer to conduct interoperability testing. | | |
| Information regarding differences in handset offerings among regions in service areas (For Service Providers only): | | |
| | | |

Status Report on Hearing Aid Compatibility

Company Name: Cingular Wireless, ATTN: Mike Roden, Exec Dir Regulatory Strategy

Address: 5565 Glenridge Connector

City: Atlanta

State: Georgia

Zip Code: 30342

Phone: (404)236-5894

Fax: (404) 236-5871

Email: mike.roden@cingular.com

Compliant Phone Models: See manufacturer's report

Phone Model

ANSI C63.19 Rating

Not Applicable

Not Applicable

Product Labeling Information:

Cingular Wireless plans to follow the labeling recommendations of ATIS Working Group 6. and will request that our vendors use the same symbols, space permitting, or notation, preferred by consumers

Outreach Efforts:

Cingular Wireless has had active leadership position on the ATIS Working Group 6 which has resulted in the production of brochures developed for the wireless industry and hearing health professionals. A draft brochure for consumers is under development and is expected prior to the Self Help for Hard of Hearing national convention this summer. In addition to supporting the Wireless Center of Excellence and sponsoring the SHHH convention, Cingular Wireless will be co-presenting at the Telecommunication for the Deaf Conference. Finally Cingular Wireless will work with consumers to modify the recommended language for inserts and manuals regarding issues with HAC compliance at the 850 MHz band.

Retail Availability of Compliant Phones:

Commission's rules require that manufacturers certify compliance with the test requirements under the equipment approval procedures in part 2 of its rules. Manufacturers are in the process of submitting handsets for such certification. Manufacturers have not offered Cingular Wireless any phones that have been certified as HAC compliant as of the date of this report.

Efforts to Incorporate Hearing Aid Compatibility into Newer Models:

Cingular Wireless has been informing our primary handset suppliers of the requirement to provide dual band devices (850 and 1900) since May 31, 2001. This has been followed up by inclusion in Cingular's "Wireless GSM Terminal Requirements" dating back to March of 2003. Cingular formally informed our primary device vendors of the need to support the HAC mandate in July 2004 through our "Cingular Wireless Regulatory Requirements". This message was reinforced in each quarterly meeting with these vendors beginning June 2004. Numerous meetings have taken place to both emphasize the need to meet the mandate as well as seek the status of the vendor's activity. On February 17th, Cingular Wireless' Sr. VP of Supply Chain sent a letter to our 5 largest device vendors both requesting current status and emphasizing the need to support Cingular in meeting the mandate. We received replies on or about April 15th and none of the vendors were able to offer certified HAC compliant phones for the 850 MHz band at the time of the response nor provide Cingular Wireless with a time table to do so.

Activities Related to ANSI C63.19 or Other Standards Work :

Cingular Wireless was an invited voting participant member company of ANSI ASC C63 (American National Standards Institute Accredited Standards Committee on Electromagnetic Compatibility C63) and has been involved in the development of the latest version of the C63.19 – 2005 standard.

Cingular Wireless has voted on all revisions to the C63.19 standard that ANSI ASC C63 has released within the last two years and is a participating member of C63 SC8 (Subcommittee 8 – Medical Devices and EMC).

Cingular Wireless is also a member of AISP.4-HAC (Alliance for Telecommunications Industry Solutions [ATIS] Incubator Solutions Program 4 Hearing Aid Compatibility) and participates in many of the

working groups. Cingular Wireless has also contributed to the AISP.4-HAC Working Group 4 Test Plan: Hearing Aid Compatibility Technical Specification (HACTS). Cingular Wireless also has a leadership position in AISP.4 HAC Working Group 6. This group is responsible for Labeling and Outreach programs.

| | |
|--|---|
| Total Number of Compliant Phones Offered: | 0 |
|--|---|

| | |
|--|---------------------------------------|
| Total Number of Non-Compliant Phones Offered: | Unknown- data not supplied by vendors |
|--|---------------------------------------|

Ongoing Efforts for Interoperability Testing with Hearing Aids:

Nothing to report at this time.

Information regarding differences in handset offerings among regions in service areas (For Service Providers only):

Cingular plans to offer all HAC compliant models nationally, however, at this time, vendors have not offered Cingular Wireless any phones that have been certified as HAC compliant as of the date of this report.

Nokia Status Report

Status Report on Hearing Aid Compatibility

Company Name: Nokia

Address: 6000 Connection Drive

City: Irving

State: TX

Zip Code: 75039

Phone: +1 972 894 4573

Fax: +1 972 894 4706

Email:
communication.corp@nokia.com

Compliant Phone Models: Nokia has identified several CDMA models that we believe will comply with the M3 rating in both the 1900 and 850 MHz bands. Nokia has identified several GSM models that we believe will comply with the M3 rating in the 1900 MHz band and will comply with the M3 rating in the 850 MHz band incorporating a variable power mode option. Final testing and verification of these products will be necessary to confirm compliance for all of these models. Any requirements or specifications identified in the TCB workshop or in the IEEE review process that are different from the approved ANSI standard may affect schedule, results, and certification date.

Phone Model | **ANSI C63.19 Rating M3 (C63.19 3.4)****

* Devices tested at independent, FCC-certified lab. Any requirements or specifications identified in the TCB workshop or in the IEEE review process that are different from the approved ANSI standard may affect schedule, results, and certification date.

Product Labeling Information: Compliant models will include "M3" text designation on the product box label

Outreach Efforts:

Nokia has broadened its library of publications for customers with disabilities to include information specific to hearing aid compatibility and digital wireless devices.

Consumer awareness. Activities and educational materials by Nokia, specific to HAC compliance and wireless communication for deaf and hard of hearing customers, include:

- Introduction to HAC and digital wireless devices for consumers and industry
- Consumer brochure for audiologists and gatekeepers
- Consumer brochure available to carriers to use at retail outlets
- Online consumer education handouts
- Nokia accessibility website with reciprocal links from www.nokiausa.com
- Updated customer care training materials with workshops planned in August 2005
- Contribution to ATIS awareness materials for consumers, audiologists, and SHHH convention
- Center for Wireless Excellence SHHH 2005 convention
- Support of TDI Conference
- Industry and advocacy workshops and panels.

Requests for hearing aid information from manufacturers

Nokia contacted hearing aid manufacturers and industry representatives, individually and on behalf of ATIS Working Group 6 Label and Outreach activities, to consolidate hearing aid and wireless device compatibility information and materials.

- Informal commissioned survey of availability of hearing aid immunity ratings
- Compiling, as available, immunity ratings of hearing aids from hearing aid manufacturers
- Advisory to hearing health organizations

Retail Availability of Compliant Phones:

Retail availability of devices at the discretion of carriers.

Efforts to Incorporate Hearing Aid Compatibility into Newer Models: Yes

Activities Related to ANSI C63.19 or Other Standards Work : Nokia is an active participant in the

ATIS AISP.4-HAC incubator, which, among other activities, addresses interoperability and compatibility of wireless device with hearing aids as referenced in the 63.19 standard. Nokia also participates in European Union eAccessibility programmes, standards activities, and numerous committees and organizations devoted to ICT for Disability & Aging, including collaborative research and development with global operators and hearing aid manufacturers.

Ongoing efforts:

In addition to providing HAC-compliant devices, Nokia is exploring new technology solutions such as:

- Mobile videophones for signing
- Interactive text services (character-by-character text recognition)
- Mobile-terminated TTY
- Captioned wireless mobile application

| | |
|--|------------------------------------|
| Total Number of Compliant Phones Offered: | See “Compliant Phone Models” above |
|--|------------------------------------|

| | |
|--|----|
| Total Number of Non-Compliant Phones Offered: | NA |
|--|----|

Ongoing Efforts for Interoperability Testing with Hearing Aids: Yes

Information regarding differences in handset offerings among regions in service areas (For Service Providers only): N/A

Nokia is further committed to developing communication devices for consumers who are hard of hearing but do not use hearing aids, representing 22 million of the estimated 28 million people with hearing loss. Providing a variety of means for communication and accessible devices is essential to all Nokia customers, regardless of disability. We take this responsibility with forethought and diligence, as evidenced by our rich history of worldwide innovations and accomplishments in accessibility.

Motorola Status Report

Status Report on Hearing Aid Compatibility

Company Name: Motorola, Inc

Address: 8000 W. Sunrise Blvd.

City: Plantation

State: FL

Zip Code: 33322

Phone: 954 723-5539

Fax: 954 723-3391

Email: al.wieczorek@motorola.com

Compliant Phone Models: All are dual band models

| Phone Model (comments) | Rating* | Air Interface | Frequency |
|------------------------|---------|---------------|--------------|
| i730 | M3 | iDEN | 800/900 ESMR |
| V60p | M3 | CDMA | 800/1900 |
| E815 | M4 | CDMA | 800/1900 |

* Ratings based on industry consensus understanding of revision draft 3.4 of the standard. Additional products are being measured as time allows now that the standard is released and FCC measurement guidance has been provided.

Product Labeling Information:

All new models will contain in the manual an improved version of the text developed by ATIS WG 6 to clarify the basis for the ratings. The exterior of the packing material of all compliant products will be marked with the M-category rating per format A developed by the ATIS Incubator Working Group 6.

Outreach Efforts:

Motorola had a booth with sample cellular telephones at the March 2005 American Academy of Audiologists (AAA) annual convention in Washington DC. Motorola also has committed to attend the Self Help for Hard of Hearing People (SHHH) annual convention in June 2005.

Retail Availability of Compliant Phones:

Models i730 is currently available products shipping since 2004.

Efforts to Incorporate Hearing Aid Compatibility into Newer Models:

Simulations are being conducted and measurements on prototype and shipping models are being made using a DASY system to identify and quantify significant contributions to RF near field signal strengths of various components in the design of these handsets. This information is being utilized to modify designs in progress in an effort to improve measured M2 ratings to M3 for several new products to be released this year. Procedures have been developed for routine product development, evaluation and subsequent FCC authorization.

Activities Related to ANSI C63.19 or Other Standards Work :

Numerous improvements to the standard were contributed since the Nov. 2004 report via 129 ballot comments on C63.19 revision drafts 3.1 and 3.3. These contributions also were made to, and verified by, ATIS AISP.4 Working Group 4. Amongst them was the design, fabrication and simulation results of the planar dipole that became the standard for the ATIS round robin experiments.

Total Number of Compliant Phones Offered: 3

Total Number of Non-Compliant Phones Offered:** 27

** Number based on GSM, CDMA, and iDEN technologies together. Not all phones available in the U.S. from Motorola have yet been measured. Information based on industry consensus understanding of revision draft 3.4 of the standard.

Ongoing Efforts for Interoperability Testing with Hearing Aids:

A proposal was made that was adopted by ATIS to form new Working Group 8 to establish a documented routine method to determine the articulation weighting factor (AWF) of new cellular telephone modulation protocols as lack of a value precludes products employing new modulation protocols from being brought to the market. This is a concern of other manufacturers as well. This proposal was based on correlating a measured modulation induced audio signal metric in a hearing aid (per C63.19 Figure 5.1 and an IEEE paper published in June 1998 by Skopec), and correlating it to subjective signal quality tests to determine AWF. This proposal was initiated because committee C63 has not been able to provide a

documented procedure for the method used in the development of ANSI C63.19-2001.

Contact was made at the AAA convention in March with technical staff of numerous hearing aid and component vendors. Most of those contacted indicated they did not measure their products per ANSI C63.19 or were unaware of it, and expressed interest in working with ATIS WG 8. They also indicated that their designs are now all digital, not analog as they were when C63.19 was originally developed, and have substantially different audio characteristics. Two parties were found that had participated in the development of C63.19-2001 and one declined to participate further.

To extend the results of this WG 8 effort into the C63.19 standard an ANSI PINS form and associated rationale was submitted to C63 subcommittee 8 at the April meeting to develop a documented technology neutral procedure to determine AWF to be released as a supplement or addendum to C63.19.

Information regarding differences in handset offerings among regions in service areas (For Service Providers only):

| |
|--|
| |
|--|

Nextel Status Report

Status Report on Hearing Aid Compatibility

| | | |
|---|--------------------------|-------------------------------------|
| Company Name: Nextel Communications (“Nextel”) | | |
| Address: 2001 Edmund Halley Drive | | |
| City: Reston | State: Virginia | Zip Code: 20191 |
| Phone: 703 433-3286 | Fax: 703 433-8355 | Email: Paula.Hall@Nextel.com |
| Compliant Phone Models: To be determined. | | |
| Phone Model | ANSI C63.19 Rating | |
| | | |
| | | |
| | | |
| Product Labeling Information: | | |
| As part of AISP.4-HAC, Nextel has joined with other wireless service providers and equipment manufacturers in developing a process to design and approve product labeling information. Upon completion, Nextel will consider adopting the standard labeling information agreed upon by the group. | | |
| Outreach Efforts: | | |
| Nextel is actively engaged and is fully participating in the AISP.4-HAC group efforts to determine and implement solutions for hearing aid compatibility. Nextel will engage in efforts, to include participation with the CTIA website that will include a list of hearing aid compatible wireless handsets, wherein manufacturers and carriers identify products and associated materials in an effort to help educate consumers on the use of wireless phones with hearing aids. | | |
| Retail Availability of Compliant Phones: | | |
| To be determined. | | |
| Efforts to Incorporate Hearing Aid Compatibility into Newer Models: | | |
| Nextel is actively engaged with its equipment vendors in the evaluation of its products for compliance with the hearing aid compatibility standards as well as the consideration and implementation of hearing aid compatibility in the development of new models. | | |
| Activities Related to ANSI C63.19 or Other Standards Work : | | |
| Nextel is participating in and monitoring all round-robin testing currently being conducted by the AISP.4-HAC, to include ANSI C63.19 v.3.1 and ANSI C63.19 v3.4. | | |
| Total Number of Compliant Phones Offered: | To be determined. | |
| Total Number of Non-Compliant Phones Offered: | To be determined. | |
| Ongoing Efforts for Interoperability Testing with Hearing Aids: | | |
| Nextel and its vendors are currently involved in the planning and development of future handsets designed to comply with all FCC rules and regulations, including those associated with the adoption of the ANSI C63.19 v.3.4 standard, and plans to work with its vendors to eventually conduct interoperability testing with various current hearing aid models, anticipating cooperation with hearing aid manufacturers. | | |
| Information regarding differences in handset offerings among regions in service areas (For Service Providers only): | | |
| N/A | | |

LG Status Report

Status Report on Hearing Aid Compatibility

| | | |
|---|---------------------------|------------------------------|
| Company Name: LG Electronics Inc. | | |
| Address: 459-9, Kasan-dong, Kemchun-ku | | |
| City: Seoul | State: | Zip Code: 153-023 |
| Phone: 82-2-850-3850 | Fax: 82-2-850-3855 | Email: espark@lge.com |
| Compliant Phone Models: | | |
| Phone Model | ANSI C63.19 Rating | |
| LG-VX3300 | U3 | |
| LG-VX4700 | U3 | |
| LG-LX225 | U3 | |
| Product Labeling Information: | | |
| Mark and U-Rating indicating in the Gift Box and HAC Statement indicating in the User's Manual. | | |
| Outreach Efforts: | | |
| We will write out the information regarding HAC in our company's homepage. | | |
| Retail Availability of Compliant Phones: | | |
| | | |
| Efforts to Incorporate Hearing Aid Compatibility into Newer Models: | | |
| We are planning to apply to all models. In case of CDMA phones, it is possible to meet the limit. But in the case of GSM phones, it is hard to meet the limit because the modulation factor is so high. We are searching for solutions now. We believe we can meet the limit for 1900 MHz GSM but have not yet found what we consider to be a satisfactory approach, for 850 MHz GSM. Testing is based on the 2005 draft of ANSI 63.19. | | |
| Activities Related to ANSI C63.19 or Other Standards Work : | | |
| We are acting as AISP.4-HAC Members and AISP.4-HAC WG-9 850 MHZ and higher power working group to search for solutions. | | |
| Total Number of Compliant Phones Offered: | 3 | |
| Total Number of Non-Compliant Phones Offered: | - | |
| Ongoing Efforts for Interoperability Testing with Hearing Aids: | | |
| We have started preliminary interoperability testing with hearing aids. | | |
| Information regarding differences in handset offerings among regions in service areas (For Service Providers only): | | |
| - | | |

Sony Ericsson Mobile Status Report

Status Report on Hearing Aid Compatibility

| | | |
|--|---|--|
| Company Name: Sony Ericsson Mobile Communications (USA) Inc. | | |
| Address: 7001 Development Drive | | |
| City: Research Triangle Park | State: NC | Zip Code: 27709 |
| Phone: (919) 472-7527 | Fax: 919-472-7451 | Email: steve.coston@sonericsson.com |
| Compliant Phone Models: (Sony Ericsson has tested two single band GSM models in house that will comply with the C63.19-2005 standard M3 or better rating in the 1900 MHz band. Product model numbers will be released upon completion of formal testing and verification.) Testing conducted by Sony Ericsson Mobile Test Lab.) | | |
| Phone Model | ANSI C63.19 Rating – 2005 Release Used for Testing * | |
| | | |
| | | |
| Product Labeling Information: | | |
| Sony Ericsson mobiles will be labeled 'M3' on the DPY packaging label in compliance with the FCC requirements for box labeling and in-box documentation for HAC compliant models. | | |
| Outreach Efforts: | | |
| <p>Sony Ericsson co-chairs the ATIS Incubator, participates in WG-6 assisting in the development of the label and preferred text for manuals and inserts describing hearing aid compatibility. Sony Ericsson will be participating as an exhibitor in the upcoming 2005 SHHH Exhibitors Conference held in Washington DC to allow consumers to try wireless devices with their hearing aids worn. SEM attended and exhibited at the 2005 AAA (American Academy of Audiologists) conference held in Washington DC to meet with hearing aid professionals on products. Sony Ericsson has an ongoing dialogue with various consumer advocacy groups through its Special Needs Center partnership with HITEC Group International. HITEC has been in business for over 22 years and is a nationally and internationally recognized provider of assistive technology. HITEC has over 2,000 audiology and special needs equipment dealers nationally. Mr. Richard Uzuanis, Exec VP of HITEC Group, is actively involved with the disabilities community. Mr. Uzuanis is on the national Board of Directors of the Deafness Research Foundation, a past member of the Board of the American Foundation for the Blind, and continues to be very active with SHHH, the Oaktree Foundation and other numerous other service groups. He is also President of Clinical Hearing Services. Sony Ericsson combined with HITEC'S experience are able to reach a larger group of consumers, advocacy groups, and consult with audiologist and professionals on the latest hearing aids, in our outreach efforts.</p> | | |
| Retail Availability of Compliant Phones: | | |
| N/A – Contingent on Carrier Retail Plans for these particular HAC models. | | |
| Efforts to Incorporate Hearing Aid Compatibility into Newer Models: | | |
| Sony Ericsson is actively investigating approaches for providing hearing aid compatibility in future models. | | |
| Activities Related to ANSI C63.19 or Other Standards Work : | | |
| Sony Ericsson is co-chair and an active participant in the ATIS HAC Incubator, including AISP.4-WG4 Testing Group, AISP.4-WG6 on Product Labeling, AISP.4 – WG8 on AWF, and AISP.4-WG9 850 MHz and Higher Power Levels. All of these groups are recognized contributors into the C63.19 Standard through the ATIS AISP.4 HAC Incubator. | | |
| Total Number of Compliant Phones Offered: | 2 | |
| Total Number of Non-Compliant Phones Offered: | | |

Ongoing Efforts for Interoperability Testing with Hearing Aids:

Sony Ericsson mobiles are evaluated by consumers wearing hearing aids at various exhibitor shows. Although this is subjective, it provides a 'litmus test' for the products and initial consumer impressions. Sony Ericsson has also purchased various hearing aids and conducts tests interoperability tests in-house on major brands of HA devices. Consultation with Audiologists and Hearing Aid manufacturers is allowing our products to be tested with some of the latest HAC devices worn by consumers.

Information regarding differences in handset offerings among regions in service areas (For Service Providers only):

| |
|--|
| |
|--|

ATTACHMENT B -- Planar Dipole Results

| E-Field [V/m] | Predicted XFDTD | Mean | STD DEV | % STD DEV | % AVG from Predicted |
|--------------------------|----------------------------|-------------|----------------|----------------------|-------------------------------------|
| 813.5 MHz | 224.8 | 206.95 | 11.87 | 5.7 | -7.94 |
| 835 MHz | 214.9 | 197.22 | 12.44 | 6.3 | -8.22 |
| 898.5 MHz | 213.2 | 203.27 | 10.62 | 5.2 | -4.66 |
| 1880 MHz | 153.6 | 143.44 | 7.56 | 5.27 | -6.61 |

| H Field [A/m] | Predicted XFDTD | Mean | STD DEV | % STD DEV | % AVG from Predicted |
|--------------------------|----------------------------|-------------|----------------|----------------------|-------------------------------------|
| 813.5 MHz | 513.9 | 500.78 | 34.53 | 6.8 | -2.55 |
| 835 MHz | 495.4 | 428.8 | 14.58 | 3.4 | -3.83 |
| 898.5 MHz | 503.2 | 501.37 | 22.94 | 4.5 | -0.36 |
| 1880 MHz | 447.8 | 405.09 | 15.98 | 3.9 | -0.5 |

ATTACHMENT C -- Challenges Surrounding the C63.19 Standard

The following are the principal concerns the Incubator has with the C63.19 2005 Standard:

- **The definition of peak power used for ratings measurements and calculations.**

The Incubator believes the deficiency of the C63.19 Standard to clearly define the power level used in testing will lead to inconsistent measurements among test labs, which in turn will lead to inconsistent ratings for wireless devices. Such inconsistencies will cause confusion for the consumers, service providers, and manufacturers. In the past year, several positions were put forward to clarify what the power level had to be. These included:

- PEP Peak envelope power.
- Peak power with formulas for calculating peak as well as tables defining the duty cycle and crest factors for each air interface.
- Average power as was in the 2001 version and the draft version 3.3.

Unfortunately, the definition was changed to “peak” in draft version 3.4 and all tables and formulas for defining peak were removed, resulting in the inclusion of vague test power levels. These levels can be clearly defined by a consensus view of what power levels are needed for testing.

- **The method of calculating the Articulation Weighting Factor (AWF).**

No scientific methods current exist for determining the AWF for new technologies such as WCDMA, VoIP, and WIFI. The subjective method that is currently used for assigning the AWF is also a detriment to newer technologies such as CDMA 2000 and VoIP. Finally, some of these technologies may have artifacts in the audible range. There needs to be a simple, accurate, scientific method for determining the AWF.

- **The Audio Band Magnetic (ABM a.k.a. T-Coil Measurement methods)**

One of the lessons learned in the Incubator’s RF Round Robin was the need to develop baseline a test lab without the variables that are introduced by the wireless device. The planar dipole test was developed to fix this deficiency and was adopted in the C63.19 2005 draft version of the standard. The same need exists for the Audio Band Magnetic (ABM) testing. The ability to baseline a lab using a TMFS (Telephone Magnetic Field Simulator) prior to measuring a WD is expected to be as beneficial as the planar dipole has been for the RF testing.

In addition, there are concerns regarding the ability of a WD to produce a strong enough magnetic signal to ensure proper coupling in all three axes. A recommended practice that would define the position of the T-coil in large in-the-ear and behind-the-ear hearing aids would help ensure that a WD T-coil would couple with the hearing aid.

- **Positioning to the closest element of the probe sensor only adds to measurement uncertainty.**

The Incubator suggested the distance from the base of the probe to the sensing element be based on the manufacturer's calibration point. In some probes the bottom of the sensing element can not be visually seen and the probe's calibration sheet does not give the dimension to the bottom of the sensor. The current method defined in C63.19 2005 causes measurement uncertainty and makes the test easier to pass.

- **Lack of frequency band specific testing levels and criteria as are addressed in IEC 60118-13: Electroacoustics - Hearing aids - Part 13: Electromagnetic compatibility.**

In the requirements for immunity establishing compatibility in microphone mode for hearing aids and WDs, IEC 600118-13 has specific frequency ranges such that 800 MHz WDs are allowed a lower criteria rating than 1800 MHz WDs.

ATTACHMENT D -- Power Level Tables

**Table 3- GSM 400, GSM 700, GSM 850 and GSM 900
transmitter output power for different power classes**

| Power class | | | | Power control level | Transmitter output power dBm | Tolerances | |
|-------------|---|---|---|---------------------|---------------------------------|------------|---------|
| 2 | 3 | 4 | 5 | | | normal | extreme |
| . | | | | 2 | 39 | ±2 dB | ±2,5 dB |
| . | . | | | 3 | 37 | ±3 dB | ±4 dB |
| . | . | . | | 4 | 35 | ±3 dB | ±4 dB |
| . | . | . | . | 5 | 33 | ±3 dB | ±4 dB |
| . | . | . | . | 6 | 31 | ±3 dB | ±4 dB |
| . | . | . | . | 7 | 29 | ±3 dB | ±4 dB |
| . | . | . | . | 8 | 27 | ±3 dB | ±4 dB |
| . | . | . | . | 9 | 25 | ±3 dB | ±4 dB |
| . | . | . | . | 10 | 23 | ±3 dB | ±4 dB |
| . | . | . | . | 11 | 21 | ±3 dB | ±4 dB |
| . | . | . | . | 12 | 19 | ±3 dB | ±4 dB |
| . | . | . | . | 13 | 17 | ±3 dB | ±4 dB |
| . | . | . | . | 14 | 15 | ±3 dB | ±4 dB |
| . | . | . | . | 15 | 13 | ±3 dB | ±4 dB |
| . | . | . | . | 16 | 11 | ±5 dB | ±6 dB |
| . | . | . | . | 17 | 9 | ±5 dB | ±6 dB |
| . | . | . | . | 18 | 7 | ±5 dB | ±6 dB |
| . | . | . | . | 19 | 5 | ±5 dB | ±6 dB |

Table 4- PCS 1900 transmitter output power for different power classes

| Power class | | | Power control level | Transmitter output power dBm | Tolerances | |
|-------------|---|---|---------------------|---------------------------------|------------|---------|
| 1 | 2 | 3 | | | Normal | Extreme |
| . | | | 30 | 33 | ±2,0 dB | ±2,5 dB |
| . | . | | 31 | 32 | ±2,0 dB | ±2,5 dB |
| . | . | . | 0 | 30 | ±3,0 dB | ±4 dB |
| . | . | . | 1 | 28 | ±3 dB | ±4 dB |
| . | . | . | 2 | 26 | ±3 dB | ±4 dB |
| . | . | . | 3 | 24 | ±3 dB | ±4 dB |
| . | . | . | 4 | 22 | ±3 dB | ±4 dB |
| . | . | . | 5 | 20 | ±3 dB | ±4 dB |
| . | . | . | 6 | 18 | ±3 dB | ±4 dB |
| . | . | . | 7 | 16 | ±3 dB | ±4 dB |
| . | . | . | 8 | 14 | ±3 dB | ±4 dB |
| . | . | . | 9 | 12 | ±4 dB | ±5 dB |
| . | . | . | 10 | 10 | ±4 dB | ±5 dB |
| . | . | . | 11 | 8 | ±4 dB | ±5 dB |
| . | . | . | 12 | 6 | ±4 dB | ±5 dB |
| . | . | . | 13 | 4 | ±4 dB | ±5 dB |
| . | . | . | 14 | 2 | ±5 dB | ±6 dB |
| . | . | . | 15 | 0 | ±5 dB | ±6 dB |

ATTACHMENT E -- PIN-C form

| | |
|-------------|----------|
| Date | 04/24/05 |
| : | |

This form may be submitted via E-mail to mweldon@ansi.org

PINS-C: COMMITTEE PROJECT INITIATION NOTIFICATION SYSTEM FORM *(Effective 1/07/05)*

*NOTE: Adoptions of an ISO or IEC standards require compliance with ANSI's Sales & Exploitation Policy.

| | |
|--|---|
| 1. Designation of Proposed Standard: | ANSI C63.19 Amendments |
| 2. Title of Standard: | American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids |
| 3. Project Intent: (Check the applicable box below) | 3a. Supersedes or Affects: (Specify designation of approved ANS standard(s) to be superseded and/or ISO or IEC standard(s)* to be adopted) |
| Create new standard | |
| *Adopt ISO or IEC standard (<u>3.0 Expedited Procedures for the Identical Adoption of an ISO or IEC standard as an ANS</u>) | |
| *Adopt modified ISO or IEC standard (<u>2.0 Requirements Associated with the Identical or Modified Adoption of an ISO or IEC Standard as an ANS</u>) | |
| *AND this adoption revises this current ANS | |
| Revise current standard | |
| Revise and Redesignate current standard | |
| Revise, Redesignate and Consolidate current standard | |
| Revise and Partition current standard | |
| Reaffirm current standard | |
| Reaffirm and Redesignate current standard | |
| Addenda to a current standard under Continuous Maintenance: (this document relates to/updates the following base document that is registered under Continuous Maintenance) | |
| Supplement to a current standard | X |
| Withdraw current standard | |
| 4. This standard contains excerpted text from an ISO or IEC standard, but is not an ISO or IEC adoption. | Check here if this standard includes excerpted text from an ISO or IEC standard but is not an identical or modified adoption of an ISO or IEC standard. |
| 5. Provide a brief explanation of the need for the project: | <p>During the revision of ANSI C63.19-2001 3 topics were identified that require further development, beyond what was provided in the revision:</p> <ol style="list-style-type: none"> 1. A generalized treatment of how to determine the Articulation Weighting Factor (AWF), Sec. 7.1, for modulations not listed. 2. Guidance on applying this standard to cordless phones. 3. Possible refinements of the T-Coil measurements of Sec. 6. |

| | | | | |
|--|--|---------------------------------------|------------------------------------|---------------------------------------|
| 6. Identify the stakeholders (e.g., telecom, consumer, medical, environmental, etc.) likely to be directly impacted by the standard: | Manufacturers of cellular phones and hearing aids, service providers, hearing aid wearers, regulators | | | |
| 7. This PINS revises a previous PINS submittal: | Note: A revised PINS is only required if the previously identified stakeholders have changed substantively (see item 6 on this form.). | | | |
| 8. Description of Contents of Standard: (Provide a one paragraph description, not to exceed 500 characters.) | <p>Currently it is not clear that changes are required for the T-Coil measurements. However, with this section becoming an FCC mandate in Sept. 2006 it is possible that refinements will be requested. Further, at the current time there is not a clear consensus on how to determine the AWF or apply this standard to cordless phones. Therefore, a PINS-C is appropriate so that these topics may be studied and recommendations for a full PINS to develop amendments to ANSI C63.19 can be presented at the appropriate time.</p> <p>It is anticipated that under this PINS-C these three topics will be studied and the potential for consensus solutions determined. Depending on the results of these studies proposals for PINS to develop amendments will be brought to the committee.</p> | | | |
| 9. Canvass Developers: (This request must include a statement of how to obtain a copy of the canvass list.) | <input type="checkbox"/> Check here to request Canvass Initiation Announcement. | | | |
| 10. Obtain a Copy of the Canvass List: (Specify name of contact or a URL address.) | | | | |
| 11. Consumer Product or Service: | <input type="checkbox"/> Check here if standard covers Consumer Product or Service | | | |
| 12. Accredited Standards Developer Acronym: | ANSI ASC C63 | | | |
| 13. Procedure Used for Consensus: (check one) | <input type="checkbox"/> Canvass | <input checked="" type="checkbox"/> X | <input type="checkbox"/> Committee | <input type="checkbox"/> Organization |
| 14. Submitter: (Specify Accredited Standards Developer submitter's name and complete contact information, address, phone, email, etc.) | Name: | Stephen Berger | | |
| | Title: | President | | |
| | Organization: | TEM Consulting | | |
| | Address: | 140 River Rd. | | |
| | City, ST, Zip: | Georgetown, TX 78628 | | |
| | Phone: | 512-864-3365 | | |
| | Fax: | 512-869-8709 | | |
| | Email: | stephen.berger@ieee.org | | |

ATTACHMENT F -- Common Symbols for Hearing Aid and Cellular Compatibility



Common Symbols for Hearing Aid and Cellular Compatibility Labeling

A Rated for Hearing Aids: M4, T3

B



C M4, T3

ATTACHMENT G -- Suggested Language for Manual or Inserts

Hearing Aid Compatibility with Mobile Phones

When some mobile phones are used near some hearing devices (hearing aids and cochlear implants), users may detect a buzzing, humming, or whining noise. Some hearing devices are more immune than others to this interference noise, and phones also vary in the amount of interference they generate.

The wireless telephone industry has developed ratings for some of their mobile phones, to assist hearing device users in finding phones that may be compatible with their hearing devices. Not all phones have been rated. Phones that are rated have the rating on their box or a label on the box.

The ratings are not guarantees. Results will vary depending on the user's hearing device and hearing loss. If your hearing device happens to be vulnerable to interference, you may not be able to use a rated phone successfully. Trying out the phone with your hearing device is the best way to evaluate it for your personal needs.

M-Ratings: Phones rated M3 or M4 meet FCC requirements and are likely to generate less interference to hearing devices than phones that are not labeled. M4 is the better/higher of the two ratings.

T-Ratings: Phones rated T3 or T4 meet FCC requirements and are likely to be more usable with a hearing device's telecoil ("T Switch" or "Telephone Switch") than unrated phones. T4 is the better/higher of the two ratings. (Note that not all hearing devices have telecoils in them.)

Hearing devices may also be measured for immunity to this type of interference. Your hearing device manufacturer or hearing health professional may help you find results for your hearing device. The more immune your hearing aid is, the less likely you are to experience interference noise from mobile phones.

ATTACHMENT H -- Information For Hearing Health Professionals

For Inductive Coupling to a Hearing Aid's Telecoil

The FCC rules require each digital wireless phone manufacturer to provide carriers with 2 commercially available handsets, and each nationwide carrier to offer its customers a minimum of 2 handsets that provide telecoil-coupling capability for each transmission technology by September 2006. Digital wireless handsets that are being tested for magnetic field strength will be assessed a rating as defined in ANSI C63.19.

Cell phone manufacturers are required to produce cell phones that test to a rating of T3 or T4 per ANSI C63.19. The higher the "T" rating, the less likely the hearing aid user will experience interference when the hearing aid is set in the telecoil mode while using a cell phone.

Hearing Aid Requirements

The FCC does not have regulatory authority over hearing aids. This authority, although somewhat limited, lies with the Food and Drug Administration (FDA). Even so, the FCC ruling encouraged the hearing aid industry to test and label their products according to the level of immunity they have to digital cell phone emissions. Hearing aid manufacturers should be consulted for the most up-to-date rating and information on their products.

Where Can I Find More Information?

ATIS (Alliance for Telecommunications Industry Solutions)
www.atis.org/atis/hac/hachome.htm

CTIA—The Wireless Association™
www.accesswireless.org

FCC (Federal Communications Commission)
<http://fp.fcc.gov/qgb/dro/hearing.html>

RERC on Telecommunications Access
tap.gallaudet.edu/wirelesstelecom.htm

Self Help for Hard of Hearing People (SHHH)
www.hearingloss.org/hat/TipsWirelessPhones.htm

Developed by:
CTIA—The Wireless Association™ with The RERC on Telecommunications Access, The Alliance for Telecommunications Industry Solutions Hearing Aid Compatibility Technical Solutions Incubator, and Self Help for Hard of Hearing People, Inc.

Hearing Aid Compatibility With Digital Wireless Cell Phones:



An Update for Audiologists and Hearing Health Professionals

The FCC Ruling

In 2003, the FCC partially lifted the exemption to hearing aid compatibility (HAC) requirements for digital wireless cell phones and developed a phase-in period for compliance by the wireless industry. The ruling requires products to be labeled for cell phones receiving certain HAC ratings based on the ANSI C63.19 Test and Measurement Standard. Labels will appear on the outside packaging of cell phones. This ruling does not include a volume control requirement.

For Acoustic Coupling to a Hearing Aid's Microphone

The FCC rules require each digital wireless phone manufacturer to provide carriers with 2 commercially available handsets, and each nationwide carrier to offer its customers a minimum of 2 handsets with reduced RF emissions for each transmission technology by September 2005. Digital wireless handsets that are being tested for reduced RF emissions will be assessed a rating as defined in ANSI C63.19.

Cell phone manufacturers are required to produce cell phones that test to a rating of M3 or M4 per ANSI C63.19. The higher the "M" rating, the less likely the hearing aid user will experience interference when the hearing aid is set in the microphone mode while using a cell phone.



Important Points my Clients Need to Know

- **Look for cell phones rated M3 or M4** (as of Sept. 2005) if a hearing aid wearer uses acoustic coupling to a telephone.
- **Look for cell phones rated T3 or T4** (as of Sept. 2006) if a hearing aid wearer uses inductive coupling to a telephone.
- **These ratings (i.e., M or T)** should be used as a guide to narrow the search for a digital wireless handset to try out before making a purchase.
- **Even though volume control** is not part of the FCC ruling, most cell phones do have a volume control.

- **The ability to control the backlighting** (i.e., whether the display is illuminated or not, and the amount of time the display stays lit) may be an important consideration for telecoil users. Interference from backlighting, which can be particularly bothersome for telecoil users, is not tested when determining a cell phone's rating.

- **The key to finding the right cell phone** for an individual hearing aid and hearing loss is to try cell phones before purchasing them.

- **As of September 2005**, most stores owned and operated by cell phone service providers (i.e., carriers) will allow customers who use hearing aids to try out cell phones in stores before purchasing them.

- **Customers should ask** how long they have to cancel the service and return a phone without penalty, if the cell phone doesn't work with their particular hearing aid.

- **It is the customer's responsibility** to make sure any cell phone that doesn't work with their particular hearing aid is returned before any early termination fees go into effect.

- **CTIA, the wireless association**, provides additional information about cell phone ratings and links to many other disability and age related services available from its member companies. This information can be found at: www.accesswireless.org

ATTACHMENT I -- Information for HA and Wireless Industry



For information about hearing aids and digital wireless phones

FCC Hearing Aid Compatibility and Volume Control
<http://www.fcc.gov/ogb/dco/hearing.html>

Gallaudet University, RERC
<http://tsp.gallaudet.edu/DigWireless.KS/DigWireless.htm>

Self Help for Hard of Hearing People Inc. [SHHH]
<http://www.hearingloss.org/hst/7tsp/WirelessPhones.htm>

The Hearing Aid Compatibility FCC Order
http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-1084_1.pdf

How can I learn more about my company's responsibilities?



ATIS Incubator Solutions Program - The Alliance for Telecommunications Industry Solutions (ATIS) is a United States organization that is committed to rapidly developing and promoting technical and operations standards for the communications and related information technologies industry worldwide using an approval by consensus approach. Over 1,100 industry professionals from more than 350 communications companies actively participate in ATIS' industry committees and Incubator solutions programs where standards and solutions are developed addressing a wide range of industry issues. The industry, health care professionals and consumers with disabilities have been working together to develop solutions and meet the FCC requirements through the ATIS Hearing Aid Compatibility - Incubator Solutions Program. This working group is an open and impartial consensus program that investigates and develops recommendations to standards for magnetic coupling and interoperability from hearing aid users, Incubator Solution Providers, Sprint, Verizon, AT&T, ATIS, Motorola, Kyocera Wireless, Nextel, Audiovox, Parasip, Siemens, Samsung Electronics, NEC America, Cingular Wireless, AT&T Wireless, Dobson Cellular Systems, Inc., Leap Wireless, Sprint PCS, Carolina West Wireless, Western Wireless Corporation, Louisiana Unwired LLC, T-Mobile, Key Communications, American Cellular Systems, Inc., Nextel Partners Inc., Brookings Municipal Utilities db/a Swiftel Communications, and HIA. Other participants within the Incubator Solutions Program include: Self Help for Hard of Hearing People Inc. [SHHH], Gallaudet University, Siemens Hearing Aids, Elymotic, Starkey, ASHA, AAA, CTIA, ANSI ASC C83, FCA and FCC. The ATIS website, www.atis.org, has information about the ATIS Incubator Solutions Program #4 on HAC (IAIS4-HAC).

www.atis.org



The CTIA Association™ is the international organization that represents all sectors of wireless communications: cellular, personal communication services and enhanced specialized mobile radio. CTIA serves the interests of service providers, manufacturers, wireless user and Internet companies and other contributors to the wireless universe. www.ctia.org. The CTIA website, www.accesswireless.org, has information for clear and hard of hearing consumers. This site provides consumers with relevant information to help them select a hearing aid service that best meets their needs.

www.accesswireless.org

Compatibility of Digital Wireless Telecommunications and Hearing Aids *Rules, Requirements and Responsibilities*



Wireless telecommunications technology is increasingly important in people's everyday lives. These wireless devices are used for transacting business, staying in touch with family and friends, and for communicating during emergencies. While the digital wireless revolution has brought many benefits to consumers, including customers with disabilities, there continue to be technical challenges which limit the use of digital wireless telecommunications for some consumers who wear hearing aids.

